



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,014	10/31/2003	Maria Ronay	YOR920030204US1 (20140-00)	8234
30678	7590	06/02/2005	EXAMINER	
CONNOLLY BOVE LODGE & HUTZ LLP SUITE 800 1990 M STREET NW WASHINGTON, DC 20036-3425			MORILLO, JANEL COMBS	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/697,014	RONAY, MARIA	
	Examiner	Art Unit	
	Janelle Combs-Morillo	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-31 is/are pending in the application.
- 4a) Of the above claim(s) 13-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-12, 30 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

22

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 6 rejected under 35 U.S.C. 102(b) as being anticipated by Kono (US 4,775,511).

Kono teaches a silver alloy, suitable for use in a variety of fields including electrical contacts (column 1 line 18), that is sulfide tarnish inhibiting (column 2 lines 15-16). Said silver alloy includes an element that forms a sulfide film before the formation of silver sulfide and thereby protects the silver alloy from tarnishing (column 2 lines 15-16), such as the addition of less than 1.5% Al (column 2 lines 40-42), which (inherently) forms a 2-5 nm thick aluminum oxide film on said silver alloy (column 2 lines 19-20). The instant specification details that though Be is the preferred alloying element, however other possible additions are Al and Si (p 6, 2nd full paragraph). Kono is held to anticipate the instant invention because Al meets the instant element limitations.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1742

4. Claims 6-12, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hensel (US 2,196,307) in view of Kono (US 4,775,511) or Tramposch (6,412,628) or Yamamoto (5,023,144).

Hensel teaches a silver alloy for electrical contacts (column 1 lines 1-7) comprising (in weight%): 1wt% Be and Ag, which falls within the alloying ranges of instant claims 7, 8, 11, 12. Be meets the instant limitations of not forming a solid solution with silver or an intermediate phase under 700°C and diffuses to the surface at temperature of 400°C or below, substantially as presently claimed.

Hensel does not specify that a layer of Be-Oxide is formed on the surface, wherein said oxide layer is about 1-10 nm thick. However, Kono teaches that it is known to form a 'film' of stable Beryllium oxide on the surface of silver alloys in order to prevent corrosion/tarnishing (column 1 lines 37-42). Alternatively, Tramposch teaches that a beryllium oxide 'film' (column 1 line 67), which forms a preferable stable oxide, can be formed on an otherwise easily corroded silver electrical contact (column 6 line 35) in order to prevent or inhibit the formation of tarnish (column 2 line 21). Alternatively, Yamamoto teaches an oxidized 'film' (BeO) forms easily for Ag alloys containing small amounts of Be (column 2 lines 1-2). The prior art does not mention the thickness of said BeO film layer. However, the presently claimed thickness of "about 1 to about 10 nanometers" is held to be within the scope of the term 'film' as used by the prior art of record. Because the prior art of record teaches a BeO film forms easily for Ag-Be alloys, or because the prior art teaches motivation to apply a film of BeO to a Ag based alloy, and because applicant has not shown the criticality of the presently claimed film/layer thickness, it is held the

Art Unit: 1742

combination of Hensel with Kono, Tramposch, or Yamamoto has created a prima facie case of obviousness of the presently claimed invention.

Concerning dependent claims 30 and 31, Hensel teaches said alloy also contains 0.002-1% Li (column 1 line 47), however, it is not clear that said element is excluded by the “consisting essentially of” language of instant claims 30 and 31. The transitional phrase “consisting essentially of” limits the scope of a claim to the specified materials or steps “and those that do not materially affect the basic and novel characteristic(s)” of the claimed invention. In re Herz, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). The applicant has not shown that the addition of Li would substantially change the basic and novel properties of said alloy.

Concerning claims 9 and 10, though the combination of Hensel and Kono, Tramposch, or Yamamoto does not specify said Ag-Be alloy is located in a recess or a part of a BEOL structure, it is held to be within the scope of the prior art to have formed/used said Ag-Be contact alloy in a variety of electronic structure configurations, including being located in a recess or present in a BEOL structure, because said prior art teaches said alloy is useful for electrical contacts.

5. Claims 6, 7, 9-11, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (5,023,144).

Yamamoto teaches a silver alloy for interconnect structure (abstract) consisting essentially of: 10-750 ppm Be balance Ag (see Yamamoto at cl. 2, see also examples in Table 1). Be meets the instant limitations of not forming a solid solution with silver or an intermediate phase under 700°C and diffuses to the surface at temperature of 400°C or below, substantially as presently claimed.

Yamamoto teaches an oxidized 'film' (BeO) forms easily for Ag alloys containing small amounts of Be (column 2 lines 1-2). The prior art does not mention the thickness of said BeO film layer. However, the presently claimed thickness of "about 1 to about 10 nanometers" is held to be within the scope of the term 'film' as used by the prior art of record. Because the prior art of record teaches a BeO film forms easily for Ag-Be alloys, and because applicant has not shown the criticality of the presently claimed film/layer thickness, it is held that Yamamoto has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 9 and 10, though the prior art does not specify said Ag-Be alloy is located in a recess or a part of a BEOL structure, it is held to be within the scope of Yamamoto to have formed/used said Ag-Be contact alloy in a variety of electronic structure configurations, including being located in a recess or present in a BEOL structure, because said prior art teaches said alloy is useful for electrical interconnect structures (see Yamamoto at column 1, etc.).

Response to Amendment

6. In the amendment filed on March 17, 2005 applicant amended claim 9, and added new claims 30 and 31. The examiner agrees that no new matter has been added. Applicant's argument that the present invention is allowable over the prior art of record because the prior art does not teach or suggest a silver and alloying element alloy with the instant alloying element oxide layer of about 1-10 nm thick has not been found persuasive. As stated above, because the prior art of record teaches a BeO film forms easily for Ag-Be alloys, or because the prior art teaches motivation to apply a film of BeO to a Ag based alloy (and wherein the instant range of about 1-10nm is within the scope of 'film'), and because applicant has not shown the criticality of the

Art Unit: 1742

presently claimed film/layer thickness, it is held the combination of Hensel with Kono, Tramposch, or Yamamoto; or Yamamoto alone; has created a prima facie case of obviousness of the presently claimed invention.

Conclusion


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM

May 31, 2005



GEORGE WYSZOMIERSKI
PRIMARY EXAMINER
GROUP 1742